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*****
* This program will calculate the recodes for the public use file.1999 NATIONAL FINAL
* 1/8/01
* Program: pufred.sas
* Programmed by: Diane Schwartz
* Date: January 20,1998
* Updated: April 9,1998
* Revised: May 19,1998 - corrected universe problem for zsmhc
* Revised: November 20, 1998 - included a new recode for HISTRY
* Revised: January 27, 1999 - corrected nummor according to new specs
* Revised: April 8, 1999 - corrected problem with nummor, not counting all
*           the cases that have no mortgage.
* Revised: April 20, 1999 - added new variable METRO2, because of a problem
*           with no geography conversion for 90 - 80 on
*           UACODE. This new variable is a recode of METRO.
* Revised: May 24, 1999 - added new variable METRO3 and took out the
*           variable METRO2
*
* Input Library: /natdata/(survey year)/topcodes
*                 /natdata/(survey year)/bridge
*                 /natdata/(survey year)/master.ssd01
*                 /natdata/(survey year)/houshldr
*
* Output Library: /natadata/(survey year)/recodes
*
* The following recodes are coded in this program:
*     cmsa - renamed from cmsa80
*     smsa - renamed from pmsa80
*     per
*     zadult
*     zinc
*     zinc2
*     phone
*     kitchen
*     plumb
*     rooms
*     confee
*     zadeq
*     zmshc
*     amtx
*     nummor
*     ran
*     rac
*     degree
*     metro
*     histry
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*          metro2 -- as of May 24, 1999 this recode is no longer done
*          metro3
*
***** ****
/* ** set up lib names ** */
libname bridg "$BRIDGE";
libname rcd  "$RECD";
libname mast "$MASTR";
libname topc "$TOPCD";

missing D R B X M N U _;

/* sort datasets on control number 13 to enable views to be created */
/*
proc sort data=topc.houshld out=work.houshld;
  by ctrlnm13;
run;

proc sort data=topc.person out=work.person;
  by ctrlnm13 person;
run;

proc sort data=mast.master out=work.master;
  by ctrlnm13;
run;

proc sort data=topc.homimp out=work.homimp;
  by ctrlnm13;
run;

proc sort data=topc.mortg out=work.mortg;
  by ctrlnm13;
run;

data tmphhr(keep=ctrlnm13 phonenum);
  set bridg.houshldr;
run;
proc sort data=tmphhr out=houshldr;
  by ctrlnm13;
run;

proc sort data=bridg.homimpr out=work.homimpr;
  by ctrlnm13;
run;
*/

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/* ** create a view to process the recodes ** */
data viewed1 / view=viewed1;
  merge topc.houshld (in = hhldend
    keep = ctrlnm13 amte amtf amtg amti amto amtt amtw
      amtxq amtxre badstep bedrms bigp burner
      camf climb confeeq cook cracks dens dining elev
      famrm flrent fmhotf freeze frent hequip prent
      holes hotpip ileak kexclu kitch leak living
      lrent ltsok m3rod mhotfe mice nowire numblow
      numcold numltl nunit2 othfn oven plugs
      railok rats recrm refr rent sharpf sink
      status tenure toilet tub txre vacancy
      vother curper buye cstmnt baths hel
      henum mcnt mg telhh telav)
  topc.person (in = endper
    keep = ctrlnm13 age hhmem rel sal);
  by ctrlnm13;
  if not (endper and hhldend) then
    do;
      if endper then
        do;
/* put 'no houshld obs for persons ctrlnm13 = ' ctrlnm13; */
        cnohh+1;
      end;
      else
        do;
/* put 'no persons obs for houshld ctrlnm13 = ' ctrlnm13; */
        cnopr+1;
      end;
    end;
run;

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data viewed2 / view=viewed2;
  merge mast.master (in=endmst
    keep = ctrlnm13 cmsa80 region pmsa80 coolday
      heatday msasta80 uacode80 urbrur80
      convdate
      rename = (cmsa80=cmsa pmsa80=smsa))
  viewed1 (in=endvw);
  by ctrlnm13;
  if not (endmst and endvw) then
    do;
      if endvw then put 'no master obs for viewed ctrlnm13 = ' ctrlnm13;
      else delete;

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end;
run;

data viewed3 / view = viewed3;
merge topc.homimp (in=hiend
keep = ctrlnm13 adbedam adbtham addbed addbth
addkit addoth adkitam adotham garag prch
deck carport othout bthroom kitchn siding
bthrdam doorwin insulat
wtrpipe plumfxt wiring carpet floorin
panel cenair heatequ septic wtrhtr dshwshr
dsposal kitrdam rnbtham sidam dooram inslam
pipeam plfxtam wiram subflam flooram panelam
cenaram htequam crptam deckam disrpam
driveam drivewy dshwam dsplam fence fenceam
finflam garagam insaam insbam inscam
nwbed nwbedam nwbtth nwbttham nwoth nwotham
nwrec nwrecam othotam outaam outbam outcam
patio patioam pool poolam porcham
renbedr renoth rnbedam rnotham roof roofam
septam shed shedam wtrham quake tornado lndslid
fire flood othdis secure securam)
viewed2 (in=endvw2);
by ctrlnm13;
if not (hiend and endvw2)then
do;
  if hiend then put 'no viewed2 obs for homimp ctrlnm13 =' ctrlnm13;
end;
run;

data viewed4 / view = viewed4;
merge topc.homimp (in=hirend keep = ctrlnm13 misina misinb misinc misouta
misoutb misoutc)
viewed3 (in=endvw3);
by ctrlnm13;
if not (hirend and endvw3) then
do;
  if hirend then put 'no viewed3 obs for homimpr ctrlnm13 =' ctrlnm13;
end;
run;

data viewed5 /view = viewed5;
merge bridg.houshldr(in=hhrend keep=ctrlnm13 phonenum)
viewed4 (in=endvw4);
by ctrlnm13;
if not (hhrend and endvw4) then

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do;
  if hhrend then put 'no viewed4 obs for hhousehldr ctrlnm13 = ' ctrlnm13;
end;
run;

data viewedt / view = viewedt;
  merge topc.mortg (in=mtgend
    keep = ctrlnm13 amtm amtm2 hepm1 hepm2 hepm3
      inspmt inpmt2 pmt pmt2 pmt3 pmt4
      taxpmt txpmt2)
    viewed5 (in=endvwd);
  by ctrlnm13;
  if not (mtgend and endvwd) then
    do;
      if mtgend then put 'no viewedt obs for mortg ctrlnm13 = ' ctrlnm13;
    end;
run;

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/* ** this section creates a data set with the recodes included. ** */
data rcd.pufrcd (keep = ctrlnm13 per zadult zinc zinc2 phone kitchen plumb
  rooms confee zadeq zsmhc amtx nummor ran rac
  region smsa cmsa degree metro histry metro3);

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length ctrlnm13 $13 per 3. zadult 3. zinc 5. zinc2 5. phone $1 kitchen $1
  plumb $1 rooms 3. confee 3. zadeq $1 zsmhc 4. amtx 4. nummor 4.
  ran 4. rac 5. region $1 smsa 4. cmsa $2 degree $1 metro $1
  histry $1 srvyr $4 metro3 $1;

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set viewedt end=send;
  by ctrlnm13;

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retain incnt 0;
retain ctrlno 0;
retain ctllst 0;
retain outcnt 0;
incnt+1;

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/*  if(mod(incnt,500) = 0) then put 'processing obs number ' incnt; */
  if first.ctrlnm13 then ctrlno+1;
  if last.ctrlnm13 then ctllst+1;

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if first.ctrlnm13 then
do;
  per = .B;

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zadult = .B;
zinc = .B;
zinc2 = .B;
rooms = .B;
confee = .B;
zsmhc = .B;
amtx = .B;
ran = .B;
rac = .B;
plumb = 'B';
zadeq = 'B';
phone = 'B';
kitchen = 'B';
metro = '.';
metro3 = '';
end;

if status = '1' then
do;

if first.ctrlnm13 then
do;
per = 0;
zadult = 0;
zinc = 0;
zinc2 = 0;
i = 1;
if (-999998 <= vother <= 999998) then
do;
zinc+vother;
zinc2+vother;
end;
end;

/* per and zadult recodes - number of persons and number of adults over 18 */

if hhmem='1' then
do;

per+1;
if (age >= 18) then
do;
zadult+1;
/*      if ctllst < 10 then
put 'zadult = ' zadult ' and age = ' age; */

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end;

/* zinc recode - income of reference person and household
members related to reference person */

if (age >= 16 and (rel = 1 or rel = 2 or rel = 20 or (rel >= 22 and
rel <= 26))) then
zinc+sal;

/* zinc2 recode - household income */

if (age >= 16) then
zinc2+sal;

end; /* end of hhmem check */

end; /* end of status check */

if status > '0' and status < '4' then
do;

/* phone recode - */
if (status = '1') then do;
  if (phonenum ne ' ' or telhh = 1 or telav = 1) then phone = '1';
  else if (telhh = 2 and telav = 2) then phone = '2';
  else phone = 'D';
end;

/* kitchen recode - complete kitchen facilities */
kitchen = ' ';

if(((nunit2 = '1' or nunit2 = '2' or nunit2 = '4')
and (sink = '1')
and (refr = '1')
and (cook = '1' or burner = '1' or oven = '1'))
or
((nunit2 = '3' or nunit2 = '5')
and (kexclu = '1')
and (sink = '1')
and (refr = '1')
and (cook = '1' or burner = '1' or oven = '1'))) then
do;
  kitchen = '1';
end;
else

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do;
if ((sink = '2')
    or (refr = '2')
    or (cook = '2' and burner = '2' and oven = '2')
    or ((nunit2 = '3' or nunit2 = '5') and (kexclu = '2'))) then
do;
    kitchen = '2';
end;
end;

/* plumb recode - exclusive use of plumbing */
plumb = '';

if ( hotpip = '1' and toilet = '1' and tub = '1' and sharpf = '2') then
do;
    plumb = '1';
end;
if ( hotpip = '2' or toilet = '2' or tub = '2' or sharpf = '1')then
do;
    plumb = '2';
end;

/* rooms recode - number of rooms */

rooms = 0;
rooms = sum(bedrms,kitch,living,dining,famrm,recrm,dens,othfn);

/* if (status eq 1 and rooms eq 0) then rooms = 1; */
if rooms >= 21 then rooms = 21;

/* confee recode - condominium or homeowners assoc. or mobile home monthly
fees */

if confeeq = . then confee = .;
if confeeq = 0 then confee = 0;
if confeeq >= 1 then
do;
    confee = (confeeq * camf) / 12;
    confee = confee - 5;
    confee = round(confee,10);
    confee+5;
end;

end; /* end of status check */

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/* zadeq recode - adequacy of housing */
if status = '1' then
do;
zadeq = ' ';

if (baths < 2 and (hotpip = '2'
or tub = '2'
or toilet = '2'
or sharpf = '1'))
or
(freeze = '1'
and (numcold >= '3' and numcold <= '8'))
or
(buye = '1')
or
(nowire = '2'
and plugs = '2'
and (numblow >= '3' and numblow <= '8')) then
do;
zadeq = '3';
end;

n = 0;
if leak = '1' then n+1;
if ileak = '1' then n+1;
if holes = '1' then n+1;
if cracks = '1' then n+1;
if bigp = '1' then n+1;
if rats = 'X' then n+1;
if n >= 5 then
zadeq = '3';

m = 0;
if ltsok = '4' or ltsok = '5' then m+1;
if badstep = '2' then m+1;
if railok = '1' or railok = '3' then m+1;
if climb >= 3 and elev ne '2' then m+1;
if m = 4 then
zadeq = '3';

if zadeq ne '3' then
do;

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if numlt >= '3' and numlt <= '8' then
    zadeq = '2';
if hequip = 7 then
    zadeq = '2';

n=0;
if leak = '1' then n+1;
if ileak = '1' then n+1;
if holes = '1' then n+1;
if cracks = '1' then n+1;
if bigp = '1' then n+1;
if rats = 'X' then n+1;
if n = 3 or n = 4 then
    zadeq = '2';

m=0;
if ltsok = '4' or ltsok = '5' then m+1;
if badstep = '2' then m+1;
if railok = '1' or railok = '3' then m+1;
if climb >= 3 and elev ne '2' then m+1;
if m = 3 then
    zadeq = '2';

if kitchen = '2' then
    zadeq = '2';
end;

if zadeq ne '3' and zadeq ne '2' then
    zadeq = '1';
end; /* end of status check for zadeq universe */

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/* zsmhc - monthly housing costs recode */

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if amtxre < 0 then amtxre = 0;
if mhotfe < 0 then mhotfe = 0;
if cstmnt < 0 then cstmnt = 0;

if status = '1' then
do;

zsmhc = 0;

if (1 <= amte <= 998) then zsmhc+amte;
if (1 <= amtg <= 998) then zsmhc+amtg;
if (amto >= 4) then zsmhc+(amto / 12);

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if (amtf >= 4) then zsmhc+(amtf / 12);
if (amttr >= 4) then zsmhc+(amttr / 12);
if (amtww >= 4) then zsmhc+(amtww / 12);

if ((amtxq >= 0) and (taxpmt ne '1' and txpmt2 ne '1')) then
do;
  zsmhc+((amtxq - amtxre) / 12);
end;

if (amti >= 1) and (inspmt ne '1' and inpmt2 ne '1') then
do;
  zsmhc+(amti / 12);
end;

if (confeeq >= 1) then
  zsmhc+((confeeq*camf)/12);
if ( 1 <= lrent <= 1996) then
  zsmhc+((lrent * flrent) / 12);
if (nunit2 = '4' or nunit2 = '5') then
do;
  if (mhotfe >= 1) then
    zsmhc+((mhotfe * fmhotf) / 12);
  end;
  if ((rent >= 2) and (prent < 1 or prent > 9997)) then
    zsmhc+((rent*frent)/12);
  if (prent >= 1 and frent >= 1) then
    do;
      zsmhc+((prent*frent) / 12);
    end;
  if (pmt >= 1) then
    zsmhc+pmt;
  if (pmt2 >= 1) then
    zsmhc+pmt2;
  if (pmt3 >= 1) then
    zsmhc+pmt3;
  if (pmt4 >= 1) then
    zsmhc+pmt4;
/* if (hepmt1 >= 1) then
   zsmhc+hepmt1; */
/* if (hepmt2 >= 1) then
   zsmhc+hepmt2; */
/* if (hepmt3 >= 1) then
   zsmhc+hepmt3; */
if (amtm >= 1) then
  zsmhc = zsmhc-(amtm / 12);
if (amtm2 >= 1) then

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zsmhc = zsmhc-(amtm2 / 12);
if tenure = '1' then
do;
  if ((cstmnt / 12) >= 1) then
    zsmhc+(cstmnt / 12);
end;

zsmhc = round(zsmhc,1);
end; /* end of universe check for zsmhc */

/* amtx recode - yearly real estate taxes */

amtix = .;
if((status = '1' and tenure = '1') or ((status = '2' or status = '3') and
(vacancy = 3 or vacancy = 5))) then
do;
  if ((status = '1' and tenure = '1') and txre = '2' and amtxq = 0) then
    amtx = 0;
  else
    if((status = '1' and tenure = '1') and txre = '1' and
((amtixq - amtxre) <= 0)) then
      amtx = 0;
    else
      if((status = '2' or status = '3') and (vacancy = 3 or vacancy = 5)
and amtxq = 0) then
        amtx = 0;
      else
        if((status = '1' and tenure = '1') and txre = '2' and amtxq >= 1)
        then
          amtx = amtxq;
        else
          if((status = '1' and tenure = '1') and txre = '1' and
((amtixq - amtxre) >= 1)) then
            amtx = amtxq - amtxre;
          else
            if((status = '2' or status = '3') and (vacancy = 3 or
vacancy = 5) and amtxq >= 1) then
              amtx = amtxq;

if amtx >= 1 then
do;
  amtx = amtx - 50;
  amtx = round(amtx,100);
  amtx+50;
end;

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end; /* end of universe check for amtx */

/* ran recode - repair and alteration number */

if status = '1' and tenure = '1' then
do;
ran = 0;
if (quake = 'X' or tornado = 'X' or lndslid = 'X' or
    fire = 'X' or flood = 'X' or othdis = 'X') then
    ran+1;

if nwbth = 'X' then ran+1;
if nwbed = 'X' then ran+1;
if nwrec = 'X' then ran+1;
if nwoth = 'X' then ran+1;

if addbth = 'X' then ran+1;
if addkit = 'X' then ran+1;
if addbed = 'X' then ran+1;
if addoth = 'X' then ran+1;

if garag = 'X' then ran+1;
if prch = 'X' then ran+1;
if deck = 'X' then ran+1;
if carport = 'X' then ran+1;
if othout = 'X' then ran+1;
if bthroom = 'X' then ran+1;
if kitchn = 'X' then ran+1;

if renbedr = 'X' then ran+1;
if renoth = 'X' then ran+1;

if roof = '1' then ran+1;
if siding = '1' then ran+1;
if doorwin = '1' then ran+1;
if insulat = '1' then ran+1;
if wtrpipe = '1' then ran+1;
if plumfxt = '1' then ran+1;
if wiring = '1' then ran+1;

if secure = '1' then ran+1;
if carpet = '1' then ran+1;
if floorin = '1' then ran+1;
if panel = '1' then ran+1;
if cenair = '1' then ran+1;

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if heatequ = '1' then ran+1;
if septic = '1' then ran+1;
if wtrhtr = '1' then ran+1;
if dshwshr = '1' then ran+1;
if dsposal = '1' then ran+1;

if misina ne '' then ran+1;
if misinb ne '' then ran+1;
if misinc ne '' then ran+1;

if drivewy = '1' then ran+1;
if fence = '1' then ran+1;
if patio = '1' then ran+1;
if pool = '1' then ran+1;
if shed = '1' then ran+1;

if misouta ne '' then ran+1;
if misoutb ne '' then ran+1;
if misoutc ne '' then ran+1;

end; /* end of universe check for ran */

/* rac recode - repair and alteration costs */

if status = '1' and tenure = '1' then
do;
  rac = 0;

  if kitrdam >= 2 then rac+kitrdam;
  if bthrdam >= 2 then rac+bthrdam;
  if disrpam >= 2 then rac+disrpam;
  if nwbtham >= 2 then rac+nwbtham;
  if nwbedam >= 2 then rac+nwbedam;
  if nwrecam >= 2 then rac+nwrecam;
  if nwotham >= 2 then rac+nwotham;

  if adbtham >= 2 then rac+adbtham;
  if adkitam >= 2 then rac+adkitam;
  if adbedam >= 2 then rac+adbedam;
  if adothing >= 2 then rac+adothing;

  if garagam >= 2 then rac+garagam;
  if porcham >= 2 then rac+porcham;
  if deckam >= 2 then rac+deckam;
  if crprtam >= 2 then rac+crprtam;

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if othotam >= 2 then rac+othotam;

if rnbedam >= 2 then rac+rnbedam;
if rnbtham >= 2 then rac+rnbtham;
if rnotham >= 2 then rac+rnotham;

if roofam >= 2 then rac+roofam;
if sidam >= 2 then rac+sidam;
if dooram >= 2 then rac+dooram;
if inslam >= 2 then rac+inslam;
if pipeam >= 2 then rac+pipeam;
if plfxtam >= 2 then rac+plfxtam;
if wiram >= 2 then rac+wiram;
if securam >= 2 then rac+securam;
if subflam >= 2 then rac+subflam;

if finflam >= 2 then rac+finflam;
if flooram >= 2 then rac+flooram;
if panelam >= 2 then rac+panelam;
if cenaram >= 2 then rac+cenaram;
if htequam >= 2 then rac+htequam;

if septam >= 2 then rac+septam;
if wtrham >= 2 then rac+wtrham;
if dshwam >= 2 then rac+dshwam;
if dsplam >= 2 then rac+dsplam;
if insaam >= 2 then rac+insaam;
if insbam >= 2 then rac+insbam;
if inscam >= 2 then rac+inscam;
if driveam >= 2 then rac+driveam;
if fenceam >= 2 then rac+fenceam;
if patioam >= 2 then rac+patioam;
if poolam >= 2 then rac+poolam;
if shedam >= 2 then rac+shedam;
if outaam >= 2 then rac+outaam;
if outbam >= 2 then rac+outbam;
if outcam >= 2 then rac+outcam;
end; /* end of universe check for rac */

/* degree recode */

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degree = ' ';
if (coolday <= 1999) then
do;
if (heatday > 7000) then

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degree = '1';
else
  if (heatday >= 5500 and heatday <= 7000) then
    degree = '2';
else
  if (heatday >= 4000 and heatday <= 5499) then
    degree = '3';
else
  if (heatday <= 3999) then
    degree = '4';
end;
else
  if (heatday <= 1999) then
    degree = '5';
else
  if (heatday <= 3999) then
    degree = '6';
else
  put 'ILLEGAL DEGREE DAY VALUE -- control number = ' ctrlNm13;

/* metro recode - former geopuf */

metro = ' ';

if msasta80 = '1' then
  metro = '1';
else
  if msasta80 = '2' then
    if (uacode80 ge 1 and uacode80 le 9999) then
      metro = '2';
    else
      if urbrur80 = '1' then
        metro = '3';
      else
        metro = '4';
    else
      if urbrur80 = '1' then
        if (uacode80 ge 1 and uacode80 le 9999) then
          metro = '5';
        else
          metro = '6';
    else
      metro = '7';

/* recode for history - set to 8 for adds and extras, otherwise set to a 1 */

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srvyr = sysget('YRSURV');

histry = '1';
if convdate = srvyr then
  histry = '8';

/* recode for metro2 -- equals 1 when metro = 1, equals 2 when metro = 2-4,
*           equals 3 when metro = 5-7
***** as of May 24, 1999 this recode will not be done *****
if metro = '1' then metro2 = '1';
if '2' <= metro <= '4' then metro2 = '2';
if '5' <= metro <= '7' then metro2 = '3';           */

/* recode for metro3 -- based on msasta80 and urbrur80 only */

if msasta80 = '1' then
  metro3 = '1';
else
  if msasta80 = '2' and urbrur80 = '1' then
    metro3 = '2';
  else
    if msasta80 = '2' and urbrur80 = '2' then
      metro3 = '3';
    else
      if msasta80 = '3' and urbrur80 = '1' then
        metro3 = '4';
      else
        if msasta80 = '3' and urbrur80 = '2' then
          metro3 = '5';

/* finish out the top and bottom code variables: zadult, zinc, zinc2 and
then output */

if last.ctrlnm13 then
do;
  nummor = .B;
  /* nummor recode - number of mortgages */
  if (status = '1' and tenure = '1') then
    do;
      if ((mg = '1') or ((mg = '2' or mg = 'B') and (hel = '1' or
hel = 'D' or hel = 'R' or hel = ' '))) then
        do;
          nummor = .;
          hcnt = .;
          if hel = '2' then hcnt = 0;
          if hel = '1' and (1<=henum<=100) then hcnt=henum;

```

```

if ((mg = '2' or mg = 'B') and (1<=hcnt<=100))
  then nummor = hcmt;
if ((1<=mcnt<=7) and (0<=hcnt<=100)) then
  nummor = mcnt + hcmt;
if nummor >=7 then nummor = 7;
if ((hel = 'D' or hel = 'R' or hel = ' ')
  or (henum = .D or henum = .R or henum = .)) then
  nummor = .D;
end; /* end of check for mg and hel */
end; /* end of universe check for nummor */

if zadult >= 11 then zadult = 11;
if (zinc <= -10000 and zinc ne .B) then zinc = -10000;
if zinc >= 999996 then zinc = 999996;
if (zinc2 <= -10000 and zinc2 ne .B) then zinc2 = -10000;
if zinc2 >= 999996 then zinc2 = 999996;

output rcd.pufrcd;
outcnt+1;
end;

if send then
do;
  put cnohh ' = number of persons obs without corresponding houshld obs';
  put cnopr ' = number of houshld obs without corresponding persons obs';
  put ctrlno ' = number of first control numbers processed';
  put ctllst ' = number of last control numbers processed';
  put incnt ' = number of view obs input';
  put outcnt ' = number of obs output';
end;

/* end of recode program */
run;

```